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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/573,481

11/08/2006

Sebastian Storck

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CONNOLLY BOVE LODGE & HUTZ LLP

1875 EYE STREET, N.W.

SUITE 1100

WASHINGTON, DC 20006

EXAMINER

BERNS, DANIEL J

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/573,481	Applicant(s) STORCK ET AL.	
	Examiner DANIEL BERNS, ESQ.	Art Unit 4162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6-30-2006; 6-2-2008</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5, 6, 9, 10, 14 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 5, 6, 9 and 10 are rejected under 35 U.S.C. 112, second paragraph. These claims recite the limitation "the catalytically active composition[.]" for which an insufficient antecedent basis exists.

4. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the term "content" therein is subject to multiple, differing reasonable interpretations: the "Sb₂O₃ content" of the outer layer vis-à-vis the inner layer could refer to either the gross Sb₂O₃ content or the Sb₂O₃'s content by weight %. The specification does not unequivocally favor one interpretation or the other.

5. Claim 15 recites the limitation "the flowing gas[.]" There is insufficient antecedent basis for this limitation in the claim. It appears that this claim most properly depends from claim 13,

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and has been treated as such for examination purposes. Should a different interpretation thereof be desired, applicant must explicitly so state in replying to this Office Action.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al., European Pat. No. 0539878 (appears in applicant's Information Disclosure Statement – "IDS") ("Ueda"), in view of Arntz et al., Pat. No. 4,621,072 (appears in applicant's IDS) ("Arntz"). Ueda discloses a catalyst and method of making a catalyst system for the vapor-phase oxidation of various organic compounds comprising contacting a catalytic substance, suspended in an oxygen flow, with a fluidized inactive carrier in a shell-and-tube type fixed-bed reactor,

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said catalytic substance having particulate diameters substantially between 0.4-0.7 μm . *See id.* at p. 3, ln. 24-37.

Regarding claims 1-3 and 7, Ueda does not, however, disclose that 90% by volume of its V_2O_5 particles are of ≤ 20 or ≤ 15 μm diameter, that 95% by volume of such particles are of ≤ 30 or ≤ 20 μm diameter, or that $\geq 50\%$ by volume of such particles are of greater than 2 μm diameter. These limitations, however, are taught by Arntz. Arntz teaches methods of making complex catalysts for the gas-phase oxidation of organic compounds, comprising spraying a suspension of catalytically active catalyst precursor particles upon an agitated, fluidized carrier bed in the presence of a flowing fluidizing gas. *See Arntz* at col. 1, ln. 8-20, col. 3, ln. 62-66 and col. 6, ln. 44-56. Arntz further teaches the use of vanadium oxide and antimony oxide as active precursor materials for its catalyst formulation, a specific catalyst example comprising Sb, Mo, V and W in a 6:12:3:1.2 molar ratio (excluding oxygen). *See id.* at col. 11, ln. 33-36. With 90% of said particles showing a 2-50 μm diameter and a preferred value of 4.7 μm , *see id.* at col. 11, ln. 39-41, Arntz implicitly teaches vanadium oxide particles within the claimed diameter ranges or at least sufficiently approaching the same to render such ranges obvious. *See, e.g., In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976) (holding that a *prima facie* case of obviousness exists where claimed ranges “overlap or lie inside ranges disclosed by the prior art”), MPEP § 2144.05; *see also In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955) (holding that changes in size and shape are not patently distinct over the prior art absent persuasive evidence that the particular configuration of the claimed invention is significant), MPEP § 2144.04 IVA. Given that Ueda and Arntz’s disclosures are both directed toward the production and use of similarly-constituted catalysts for the vapor-phase oxidation of compounds such as aromatic hydrocarbons,

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and in light of Arntz's statement that varying the coating thickness of the catalytically active materials upon a given support allows the practitioner to calibrate the overall catalyst's activity to a desired amount, *see id.* at col. 1, ln. 35-37, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize vanadium oxide particles of Arntz's size distribution in preparing a catalyst according to Ueda's formulation and methodology.

Regarding claims 4, 6, 8, 11 and 12, Ueda's disclosed catalyst compositions further comprise 0.2-1.2 parts by wt. (hereinafter "pbw") P as P_2O_5 , 0.5-5 pbw Sb as Sb_2O_3 , and 0.3-1.2 pbw Cs as Cs_2O . *See id.* at p. 3, ln. 24-37. Specific catalyst compositions include such values as 0.3 pbw P_2O_5 , 2.0 pbw Sb_2O_3 , and 0.84 pbw Cs_2O . *See id.* at Table 1.

Regarding claims 5, 9 and 10, Ueda's disclosed catalyst compositions comprise 1-20 pbw V_2O_5 and 80-99 pbw porous anatase TiO_2 (the sum of said components equaling 100 pbw). *See id.* at p. 3, ln. 24-37. Specific catalyst compositions include such values as 5 pbw V_2O_5 and 95 pbw TiO_2 . *See id.* at Table 1.

Regarding claim 13, as above, Ueda discloses a catalyst and method of making a catalyst system for the vapor-phase oxidation of various organic compounds comprising contacting a catalytic substance, suspended in an oxygen flow, with a fluidized inactive carrier in a shell-and-tube type fixed-bed reactor, said catalytic substance having particulate diameters substantially between 0.4-0.7 μm and comprising 1-20 pbw V_2O_5 and 80-99 pbw porous anatase TiO_2 (the sum of said components equaling 100 pbw), further 0.2-1.2 pbw P as P_2O_5 , 0.5-5 pbw Sb as Sb_2O_3 , and 0.3-1.2 pbw Cs as Cs_2O . *See id.* at p. 3, ln. 24-37. Specific catalyst compositions include such values as 5 pbw V_2O_5 , 95 pbw TiO_2 , 0.3 pbw P_2O_5 , 2.0 pbw Sb_2O_3 , and 0.84 pbw

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Cs₂O. *See id.* at Table 1. Ueda does not, however, disclose that 90% by volume of its V₂O₅ particles are of ≤ 20 μm diameter, that 95% by volume of such particles are of ≤ 30 μm diameter. These limitations, however, are taught by Arntz. As above, Arntz teaches methods of making complex catalysts for the gas-phase oxidation of organic compounds, comprising spraying a suspension of catalytically active catalyst precursor particles upon an agitated, fluidized carrier bed in the presence of a flowing fluidizing gas. *See* Arntz at col. 1, ln. 8-20, col. 3, ln. 62-66 and col. 6, ln. 44-56. Arntz further teaches the use of vanadium oxide and antimony oxide as active precursor materials for its catalyst formulation, a specific catalyst example comprising Sb, Mo, V and W in a 6:12:3:1.2 molar ratio (excluding oxygen). *See id.* at col. 11, ln. 33-36. With 90% of said particles showing a 2-50 μm diameter and a preferred value of 4.7 μm , *see id.* at col. 11, ln. 39-41, Arntz implicitly teaches vanadium oxide particles within the claimed diameter ranges or at least sufficiently approaching the same to render such ranges obvious. *In re Wertheim*, MPEP § 2144.05; *In re Rose*, MPEP § 2144.04 IVA. Given that Ueda and Arntz's disclosures are both directed toward the production and use of similarly-constituted catalysts for the vapor-phase oxidation of compounds such as aromatic hydrocarbons, and in light of Arntz's statement that varying the coating thickness of the catalytically active materials upon a given support allows the practitioner to calibrate the overall catalyst's activity to a desired amount, *see id.* at col. 1, ln. 35-37, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize vanadium oxide particles of Arntz's size distribution in preparing a catalyst according to Ueda's formulation and methodology.

Regarding claim 15, while Ueda does not disclose a fluidizing gas temperature of 60-150 deg. C, Arntz's disclosure teaches the use of a 60-100 deg. C flowing fluidizing gas in preparing

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its complex catalysts. Given that Ueda and Arntz's disclosures are both directed toward the production and use of similarly-constituted catalysts for the vapor-phase oxidation of compounds such as aromatic hydrocarbons, both Ueda and Arntz employing a flowing fluidizing gas to assist with said production, it would have been obvious to one of ordinary skill in the art at the time of the invention to set the temperature of said gas within Arntz's range in preparing a catalyst according to Ueda's formulation and methodology.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda and Arntz as applied to claim 13, above, further in view of Heidemann et al., Pat. No. 6,586,361 (appears in applicant's IDS) ("Heidemann"). Whereas Ueda and Arntz's collective supported catalyst does not further comprise an outer layer and an inner layer, the former's Sb_2O_3 content being 50-100% lower than the latter's, these limitations are provided by Heidemann. Heidemann teaches Sb_2O_3 -containing V_2O_5 - TiO_2 catalysts comprising two concentric layers of catalytically active composition, wherein the outer layer's Sb_2O_3 content is 50-100% lower than said catalyst's inner layer Sb_2O_3 content. *See* Heidemann at col. 3, ln. 40-58, col. 4, ln. 1-9, and clm. 1. Given that Ueda, Arntz, and Heidemann's disclosures are all directed toward the production and use of similarly-constituted catalysts for the vapor-phase oxidation of compounds such as aromatic hydrocarbons, and in view of Heidemann's teaching that producing multilayered, supported catalysts would enable enhanced selectivity of the aromatic oxidation reaction being catalyzed, *see id.* at col. 3, ln. 36-39, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ multilayering and varied Sb_2O_3 contents within Ueda and Arntz's collective catalysts as taught by Heidemann.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL BERNES, ESQ. whose telephone number is (571)270-5839. The examiner can normally be reached on Monday thru Thursday, 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached at (571)272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DB/

October 14, 2008

/Melvin C. Mayes/

Supervisory Patent Examiner, Art Unit 1793